

# **Building Capacity – Diversification of the Swedish Land Surveying Education**

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**Key words:** land surveying, higher education, Bologna process, diversification

## **SUMMARY**

The university education of surveyors in Sweden has a mixture of engineering, planning, law and economy. The surveying profession has successively broadened its domain into new areas, such as land management, property development and other land related areas. The volume of traditional engineering courses has diminished, though covering GIS.

The Royal Institute of Technology was exclusive until the 1990's in providing a master programme in land surveying. A proliferation of other university programmes at master level and some bachelor programmes has diversified the education market.

The Bologna process is transforming the national education programmes. International cooperation encourages exchange of individual students, and also the development of special MSc level programmes in Sweden, aiming at the international market. The mixture of international and Swedish students creates an international environment at campus. The Government's aim is to increase the exchange further more.

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## **1. BACKGROUND**

The Swedish land surveying education is facing major changes, due to national and European demands. Most of these demands are logic and results of national and EU concerns on an increased exchange within the European Higher Education Area, as well as general EU policies. The demands lead to successive changes in the educational offer, and should be considered as a natural way to identify efficient ways to provide an educational product that satisfies the labour market and the youngsters. At the universities we have to understand the tendencies in the demand, as well as the official requirements.

The paper will review the Swedish area of education in land surveying, its current status, problems and challenges, as well as future perspectives. We will present the situation from a perspective on EU policies, as a way to assess the Swedish integration and progress in the education area. The basis is found in the agreement on the Bologna process.

The Bologna process is well known in Europe, and to some degree also elsewhere. We will therefore not make an exhaustive review of the process. However, we would like to use some of the key concerns and indicators as a way to present the current Swedish situation.

Some countries might have a more long term perspective in adapting their educational system to the Bologna process. There might be various reasons, e g, major differences between the national system and the key system of the Bologna process, domestic diverging ideas on the benefits of the Bologna process, practical and political difficulties. The Swedish government has agreed to work through the Swedish educational area in order to comply with the requirements of the Bologna process until 2010 – just two years ahead.

The strong dedication of the Swedish government, and the National Agency of Higher Education (HSV), as well as the universities might be understood as a strategic choice to identify education as a key area of the common market of the European Union. As a small country, in population, we might feel the need to be at the frontline in this area of the EU. In other key areas of the EU we have not been so eager to join the European way. The admission to the EU was quite late as a Western European country – in 1995, and we rejected the common currency, Euro, decided in a referendum in 2003. The educational area is less sensitive in a public opinion, and it might be much easier to accept a joint market in higher education. Such a market could hardly be prejudicial.

## 2. THE KEY AREAS OF THE BOLOGNA PROCESS IN SWEDEN

The Bologna Process aims to change the education system in Europe in various ways. Three areas are identified (European Commission 2008):

- 1) Introduction of the three cycle system (bachelor/master/doctorate),
- 2) Quality assurance
- 3) Recognition of qualifications and periods of study.

These areas do not seem to be difficult to adopt, at least not at a first glance. But a more detailed analysis requires quite some efforts to identify changes and measures to put them into practice.

Firstly, the three cycle system is a real challenge, as the educational systems vary a lot between the European countries, as well as between different faculties at a national level. Several countries have a unified master system, with 5 years of university studies without an intermediate degree at bachelor level. One survey identifies only 5 of 19 countries with a bachelor level, while the joint master programme of five years is more common – 11 countries (Natchitz 2007). There are some engineering programmes of four years, though with a tendency to disappear (Clergeot 2007).

In Sweden we have adapted all university programmes to the three cycle system. This implies that we from autumn 2007 have expanded the engineering programmes from 4.5 to 5 years of studies. The bachelor level is compulsory from 2007, based on the Bologna process and a Governmental decree. However, it has been developed in different ways at the universities.

At the Faculty of Engineering at Lund University we offer a general BSc degree in engineering, but without reference to the specific programme in the diploma. The main objective is to offer the students to complete the master level, which will include a specification of the programme. This strategy is partly contradictory to the aims of the Bologna Process, in particular the idea to promote the students to change universities at each level. The MSc degree is thus a joint BSc and MSc degree of five years of studies (300 ECTS), with just one MSc degree, MSc in Engineering, Land Surveying and Management. The specific specialisation during the 4<sup>th</sup> and 5<sup>th</sup> year is not included in the title of the exam, but only described through the list of courses. However, there are some MSc programmes offered by the Faculty of Engineering, mainly as specific international MSc programmes, e.g. in GIS, Sustainable Urban Design and Water Resources. The Swedish students are the main group, thus starting at BSc level and continuing until completing the MSc level. We could identify that a few, but potentially an increasing number of students express their interest in changing universities between the BSc and MSc levels, or at least spend one-two semester abroad, within the exchange programmes that the University offer. We could expect a continued expansion of MSc programmes and increased number of international students.

At KTH, the joint BSc and MSc programme in Civil Engineering and Urban Development have been introduced as described about Lund above. At the same time KTH is offering three

years BSc programmes and two years MSc programmes. No Bachelor programmes, with exception for one in Banking and Finance, are given in the surveying field, only programmes on Master level. The idea is to as far as possible integrate the courses in the master programmes with the final two years of the joint programmes.

The Luleå University of Technology is also offering a joint BSc and MSc programme. The area of land surveying is offered only at the 4<sup>th</sup> and 5<sup>th</sup> year, and it is designed as one of several MSc specialisations. The studies are still part of the Civil Engineering programme, or alternatively in Architecture Engineering. The specialisations in land surveying at MSc level is a good example of using a basic engineering programme within the urban development area, and add a specialisation in another area closely linked to the BSc area of studies. Some doubts have been raised concerning the depth in the specific land surveying area, as it requires studies in several new areas at the MSc level, in particular law, economics and geomatics. However, the profile of a Luleå MSc engineer will be unique in its own way, and it is presumed to be highly appreciated by the labour market.

The University of Gävle is specialised in geomatics, and has developed a variety of courses at BSc and MSc levels. The menu of programmes is partly a way to attract students with different “packages”, and offering different ways at BSc or MSc levels. These ‘packages’ have been developed as a way to harmonize their programmes in a Bologna perspective (Brandt, Karlsson & Ollert-Hallqvist, 2006). The university is working in collaboration with the National Land Survey of Sweden, localized just 1 km from the university campus.

University West is specialised in more applied sciences at the programmes at BSc level, and they do not offer any MSc programme at all. The BSc programme of land surveying was the starting point for this new scientific area at the university and it has been highly appreciated by the board of the university, as a programme with a high enrolment, attracting a stable number of students. It has increased from 30 students at the start in 1996 to 45-50 nowadays.

The two other key areas of the Bologna process, quality assurance, and recognition of qualifications and periods of study will be further described below, as some of the indicators define the achievements of these areas quite well.

Generally, it could be stated that quality in education is a main focus, including formal requirements of pedagogic qualification for all lecturers, as well as development of portfolios. Special pedagogic units are developed at the faculties of engineering. There might be a tendency of these faculties to be more progressive in assisting the lecturers in pedagogical development, maybe as the areas of engineering to some extent is quite separate from the area of pedagogic.

The third key area, recognition of qualifications and periods of study, is based on an advanced perspective of integration of professionals at the European labour market. Europe is expected to be one area of higher education, which means mobility during the studies, as well as a professional with an exam as defined in the Bologna process. This integration has to be developed in our area of land surveying. Enemark (2002) focuses on many aspects of

innovations in surveying educations.

### 3. INDICATORS OF THE SWEDISH HIGHER EDUCATIONAL AREA

The general aim of the higher European educational area will be developed through a number of specific main indicators (Internationella Programkontoret 2008):

- unified system of comparable exams
- basically two levels (BSc and MSc)
- unified credit system (ECTS – European Credit Transfer System)
- promotion of mobility
- promotion of European cooperation on quality assurance
- promotion of the European dimension in higher education

The indicators are useful to assess the progress of the Swedish integration in the higher European educational area. We will analyse the six indicators applied to the land surveying area.

#### 3.1 Unified System of Comparable Exams

The Diploma Supplement is a main tool to identify the content of the education program. The Swedish National Agency of Higher Education (HSV) demands the universities to make this description. As mentioned above, the land surveying area is already diversified, covered by five universities<sup>1</sup>. Out of the total of 61 universities in Sweden, one third are more classical universities, one third new universities and one third small universities in specialized areas. The first two groups are the basis for launching land surveying programmes. A deregulation of the Swedish educational market was introduced in 1993, and we have seen a diversification of the educational market (Fritzell, 1998). This includes the land surveying area.

The Royal Institute of Technology (KTH) has been the main actor, providing land surveyors to the labour market since the integration of the land surveying area as an engineering programme in 1932. The expansion of the land surveying programmes within the deregulated policy started in 1992, when the Faculty of Engineering at Lund University started a similar land surveying programme, and also keeping the same name – the traditional 'land surveying' ('lantmäteri'), though nowadays translated into English as 'land surveying and management', in order to better describe the Swedish tradition of land surveyors involvement in land management.

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<sup>1</sup> The Swedish National Agency of Higher Education (HSV) defines the institutions as universities and university colleges, the former ones entitled to award postgraduate degrees (as well as undergraduate degrees). The latter ones are entitled to award only undergraduate degrees. The latter ones might also be called new universities. In the paper we call the university colleges just universities.

As mentioned above, three other new universities have launched BSc and MSc programmes in land surveying, though with specific names, in order to describe the profile better and adapt to the reality of each university. In all, the five universities have the following programmes:

- KTH, Stockholm: MSc in Civil Engineering and Urban Development (integrated BSc and MSc program). Started in 1932. Total enrolment yearly of about 150 students, out of which about a third (2007) chooses land surveying subjects, as their main or partly predominant area in specialised courses.
- Lund University, LTH: MSc in Engineering, Land Surveying and Management (integrated BSc and MSc program). Started in 1992. Total enrolment: about 60 students.
- University West, Trollhättan: BSc in Land Surveying. Started in 1996. Total enrolment: about 40-50 students.
- University of Gävle, various BSc and MSc programmes in geomatics. Started in 1990 and it has developed different programmes since then. Total enrolment: about 40 students.
- Luleå University of Technology: MSc programmes in Civil Engineering and Architecture (integrated BSc and MSc programmes), with option to specialize in land surveying during the MSc part of the studies. Total enrolment: about 100 students, with an expected enrolment in land surveying of some 20 students. The land surveying specialisation will be available for the students that started at BSc level in 2007.

The diversification of programmes and the integration in other urban development areas emphasise the need of a Diploma Supplement. The specific courses are organised in specialisations, and a list of the courses will be as an additional supplement, which the Swedish labour market pays attention to. But the Diploma Supplement is evidently required in order to describe and identify the diversification of programmes. The task to describe the programme in a short way for the supplement is not easy. Several approaches might be used, e.g. the professional area, the scientific areas, and the capacity. E.g. the programme at Lund University is defined in English as Land Surveying and Management, being the word 'Management' an addition to the original translation from the Swedish name 'lantmäteri', as a way to describe the Swedish emphasis on land management. Some alternatives were available, e.g. land administration, cadastral development, and property development. Other names within the area, e.g. geomatics, real estate planning, urban development, and property management focus on other aspects within the scientific field. However, we found that /land/ management was the most relevant name of the programme.

KTH made a more profound review of the educational area, in merging the two programmes of land surveying and civil engineering respectively. The new integrated area was defined as 'samhällsbyggnad', translated to English as civil engineering and urban development. The Swedish name is concise and does not contain the two traditional areas at all, i.e., civil engineering and land surveying, while the translation in English has got the first one – civil engineering, but not the second area (land surveying). Does it mean that land surveying has

been extinguished? Not necessarily! The main reason is that the traditional name, land surveying ('lantmäteri'), has turned less used and less understood by youngsters with a predominantly urban background, though it is still a wellknown name in the professional sector. The 'market label' has been changed. The 'label' 'lantmäteri' (land surveying) has a long tradition, since the 17<sup>th</sup> century, and as an engineering programme since 1932, at KTH. The 'trade mark' has lost its meaning among many youngsters, in particular the urban population with less contact with cadastral and land management issues. However, it is still a strong 'trade mark' in the professional field. Thus the Diploma Supplement is also a challenge in a national context. The 'trade mark' of the programme needs to be defined and understood as an attractive sign. The problem is that two in principle totally different professions have been merged into one programme, which causes a great insecurity how many students shall choose the civil engineering field or the surveying one respectively after the first two study years.

Two of the other universities have also identified their education programmes with new 'labels' – Luleå within the civil engineering or alternatively architecture engineering programmes, and the University of Gävle in geomatics. Lund University and University West have kept the traditional name of the programme – land surveying ('lantmäteri') – though the translation to English is adding land management as well.

### **3.2 Basically Two Levels - BSc and MSc**

The two level system of the Bologna process is challenging the traditional engineering programmes at master level. The programmes are offered as integrated programmes of five years, thus without a separation with a Bachelor degree. However, the Bologna process implies a separation, as well as the unitary length of three plus two years. This part of the Bologna agreement forced the central government to review and accept an increase of the previous length of 4.5 years of studies to 5 years.

The commitment to the Bologna two level systems has a more fundamental effect on the traditional integrated engineering programmes. The alternative to promote a two step educational strategy is to some extent appreciated by the universities, partly as a mean to offer a broad spectrum of programmes to the youngsters. However, the universities and institutes of technology have adopted different strategies.

The following programmes are offered at the five universities mentioned above, within the land surveying area:

#### **KTH**

- Integrated BSc+MSc programme (in Civil Engineering and Urban Development)
- Specialised MSc programmes, e.g. in Land Management; and Geodesy and Geoinformatics
- Specialised BSc programme in Real Estate and Finance

#### **Lund University**

- Integrated BSc+MSc programme
- Specialised MSc programmes: e.g. in GIS; and Sustainable Urban Design
- Integrated MSc programmes

#### University West

- BSc programmes in land surveying; real estate broking

#### University of Gävle

- BSc programmes in geomatics; real estate management, real estate broking
- MSc programmes in the same areas as above, with diversified enrolments and profiles

#### Luleå University of Technology:

- Integrated BSc+MSc programmes, but with a specific MSc specialisation in land surveying.

In addition, the policy of Chalmers Institute of Technology (CTH, in Gothenburg – without land surveying programmes), has been to strictly divide the traditional integrated BSc+MSc engineering programmes into a specific BSc program with an exam, i.e., for all students, and start a new enrolment of students at MSc level, with the diversification in MSc programmes. These specific MSc programmes are similar to the specialisations at the other institutes/universities, being part of their integrated BSc+MSc programmes. All the BSc students at CTH have access to the MSc programmes. The tendency to separate the BSc and MSc levels might become the common practise in the future.

### 3.3 Unified Credit System – European Credit Transfer System (ECTS)

The credit system might appear as a simple unitary issue. The previous Swedish credit system used the formal weeks of studies as a unit, crediting one year's full time studies of 40 weeks with a value of 40 university credits. The transformation to the ECTS has just been a matter of adding a factor of 1.5, to become 60 ECTS for a study year.

There are some other issues in the unified credit system with major effects on the educational system. The scale of marks is more extended in the Bologna process, with in all seven grades: A-E (pass grades), and the two fail grades, F+ and F. The traditional system in Swedish education is three pass grades, except the fail grade. Many other faculties apply only two pass grades – passed and well passed. The classification of students in a more diversified grading system is mostly not appreciated, as our cultural tradition is more based on collaboration within the student group as a key strategy of the learning process. Inserting more grades is understood to threaten the pedagogic system of student collaboration. The examinations might be more directed towards knowledge of facts, while the capacity of using the knowledge in a certain context, e. g., in a course project work, and might be less focussed.

A general objection to a more diversified examination system, e.g. by the Swedish Association of University Teachers (SULF), called the attention of the central government and the Swedish National Agency of Higher Education and proposed them to maintain the

current system of only three pass grades. Foreign students are always guaranteed the full grading scale. KTH has initiated a work to introduce the seven grade system also for the Swedish students, including for the Master thesis work. This will change the attitudes and ways to study for the students. It is still premature to assess the benefit of such a change.

### **3.4 Promotion of Mobility**

The students easily accept the idea of mobility. The youngsters of today are worldwide people, not only on the web, but also in reality. During the last two decades, the mobility of students has increased a lot and turned the universities into a new world of options. The students ask for options for international exchange of their studies, and it has become an important factor of attractiveness of each university.

The current system of student exchange is mainly based on one or two terms exchange studies, but without a separate degree at the foreign university. The number of foreign students has increased rapidly. In Sweden there were 27,900 foreign students in 2006/07, compared to 9,600 in 1997/98. The number of Swedish students studying abroad, on exchange programmes or so-called free movers has also increased a lot during the same period (Högskoleverket 2008a). The free movers in Sweden were about 16,700 in 2006/07, while the students in exchange programmes were 11,200. About two thirds of the exchange students are Europeans. 21 % of the students are from Asia, which is the continent with the highest increase of the applications and enrolment. 40 % of the students study natural science and engineering. The international students are today becoming a more frequent and visible part of the courses, and at campus in general. These international students are 7.3 % of all students at Swedish universities in 2006/07, with top position at almost 20 %. KTH is at the second position, with 18.9 % international students of all their students. Lund university (counting all faculties), with 8.8 %, is above the average, but with an objective to increase the number of international students more – though with constraints in providing housing for the students.

At local level at the Faculty of Engineering at Lund University (LTH), the objective for student exchange is that at least 50 % of the students will spend a part of their studies abroad. The number is still much lower – about 30 %. About 6 % of the students perform their master thesis work abroad, which is registered as a study period abroad as well. The limited number of LTH engineering students abroad in exchange programmes means a potential for an increased number of students. A constraining factor for land surveying students is different curricula profiles abroad. The curricula in the Nordic countries have more emphases on legal and economic subjects than in most European countries. As the exchange studies usually are done during the final year of studies, the students would like to specialize even in their exchange studies. Specialisations in real estate law or real estate economy are seldom available in faculties of engineering.

The university is working at different levels to increase international exchange studies for the Swedish students. The number of foreign exchange students at LTH exceeds the number of LTH engineering students abroad with 40-50 %. About 80-90 % of these foreign students are

from other European countries. At all faculties at Lund University, the number of Swedish students in exchange programmes was 966 in 2007, while incoming students were 1690, except 787 freemovers (Högskoleverket 2008b).

KTH had 3,230 foreign students in 2006/07, being 1,200 students in exchange programmes, 1,200 freemovers and 800 students at basic level. Only 503 Swedish students studied abroad – as exchange students (Högskoleverket 2008b). Many of the foreign students are from China and the Indian subcontinent.

However, there is a debate at national level that we might introduce tuition fees for non EU students the number of foreign students. This might decrease the number of these non-EU students dramatically.

The Bologna process will add another aspect to this objective, as a change of universities for MSc level studies, after completing the BSc degree, i.e., for a complete MSc programme of two years. Such a choice will be a more definite and independent move for the student. This will enable the student to understand another university and another country, enrich his/her network, and establish a solid basis for future exchange of experience within Europe.

As mentioned above, a problematic factor in this context is that the differences between different national legal systems are quite big, especially in the land related field. This might force a student with a Master from a foreign university to study some additional courses at the home university in order to make the exam attractive also at the national labour market. The 1996 survey of Professor Allen on survey educations in 15 western European countries is still useful to understand these differences (Mattsson 2001). But we understand the need of exchange of students and lecturers as a mean to integrate the European market of land tenure development (Mattsson, 2007; Grover, Törhönen & Palmer 2006; Borges & Sørensen 2006).

### **3.5 Promotion of European Cooperation on Quality Assurance**

A new European dimension is also focussed in the area of quality assurance. It has already become necessary to understand the grades of courses for students in international exchange programmes, as their courses are integrated into the total of courses for the MSc degree.

However, there are theories in pedagogic that could be used in identifying the learning process of the student. The Bloom taxonomy of the learning outcomes is taught in pedagogic courses for university lecturers. The SOLO taxonomy offers another idea to understand the learning process. The challenge is to use such ideas in the assessment of students individually. A first step has been taken in rewriting the course curricula in learning outcomes, and in that way to define a set of 6-8 specific learning outcomes. They have to be assessable, i.e., indicators on the learning process and its outcomes for the single student. These outcomes are part of the official and public specification of the course, and that the students will be able to understand how to work towards a full accomplishment of them. When reaching all of the outcomes, the student is guaranteed a pass grade for the course.

This seems to clarify for the students, and for the lecturers, the requirement of the course, which should imply eventual changes in the course structure in order to permit a systematic study process to reach the required outcomes. But, the theory is not always compatible with the practise at each course. There is a continuous work to be done to clarify the learning process, for the student as well as for the lecturer.

Another part of the leading idea of learning outcomes is how to assess the students above the pass grade. The learning outcomes are only defining the pass grade, i.e., the grade E. But how should the A-D grades be defined? As mentioned above, it is sometimes understood as a threat towards the idea of student collaboration in the learning process. There is also the crucial point on relative or absolute distribution of grades. The idea of learning outcomes is based on an absolute definition – when you understand and fulfil all of the defined outcomes, then you are guaranteed to pass – with an E. But if you want a better grade, D, C, B, or A, then we have to compare the more advanced outcomes, and review how the total group of students has succeeded. If a student group one year is doing very well, by some reason, will I as a lecturer and examiner be allowed to award more ‘B’s and ‘A’s than I use to do? The idea of a random distribution of outcomes in a student population, expressed as a standard deviation, might differ from the experience of the lecturer. The distribution of higher grades and the average of the student group are not always compatible in the work of the lecturer. There is even an incentive for the lecturer to work in collaboration with the students towards higher grades.

An important part of the work has been done with the course curricula, by redefining the criteria to pass the courses. As mentioned above, the concept of ‘Learning Outcomes’ has been used. It is a way to define the knowledge, capacity and attitudes of the student after each course. The previous course descriptions were more focussed on describing the scientific area, as extensive as possible, being the perspective of the lecturer, not the student perspective. The scientific area is still described in the new course curricula, but a new focus is the perspective of what every student has to know – the learning outcomes – as a minimum criteria. It is expressed in 6-8 specific points, each with indicators that make sense for the lecturer and the students. This demand to redefine the course curricula has encouraged the lecturers and the board of the programmes to critically analyse the courses. Expressions as ‘understand’ are not a sufficient criteria, while ‘could explain’ or ‘could describe’ put another focus on the capacity of the student.

Nevertheless, such transcriptions of course curricula could be a merely academic exercise without any practical importance. The next step is therefore to assess how well the indicators work and how lecturers and students use them in the courses.

The aspects on curricula development, learning outcomes, differentiated pass grades, and distribution of higher grades – all these aspects are focussed, discussed and criticized by lecturers, students and the boards of the programmes. This is a good example of the analysis of quality assurance in higher education.

### **3.6 Promotion of the European Dimension in Higher Education**

The sixth and final main indicator has not been as visible at the universities as the previous five indicators. The idea of a specific European dimension seems to be somewhat restricted in the worldwide context. But most students are even more concerned and oriented towards the national market, being the main market for them, due to cultural, linguistic and other factors.

The idea of a European perspective might be a logic consequence of the previous main indicators, but it is also evident that we might be too concerned of the own national perspective. At local level at the universities we might be less aware on this main indicator. Is it time to wake up, and understand the depth of the European dimension?

## **4. CONCLUDING ANALYSIS**

The Swedish Higher Education system is part of the European Higher Education Area. It is difficult to object to such a perspective. We need to understand our role in a broader context. The Swedish Government has signed the Bologna process, and the idea of unifying the higher education in Europe seems to be easy to understand and join. Higher education is by nature a both national and non national issue. Science is universal, and we have to be active in encouraging the research, and also the higher education to such an international context.

The European Union has an advanced agenda on unifying the countries, people, economies and politics. This integration is also including land issues, and it is evident in the integration process of Eastern European countries (Grover 2006). In Sweden we are sometimes reluctant and sceptical towards the idea of a centralised system in Europe. But the Bologna process is understood to be a strategic tool to keep our universities at a top level. The competition is not only existing at national level, but also increasing at an international level, in Europe, and also worldwide. The higher education area of Europe is an objective that demands quite some efforts to understand and to work through. The diversified national, linguistic and cultural characteristics of Europe might be an advantage, as we easily understand the need of integration within this European context.

However, there is a contradiction in the higher education concerning the national and international arena. Even if the education and labour market will be more international, most students will at least for a foreseeable future mainly work in the national arena, using their mother language. This has to be considered in the academic programmes as well.

The market of university education is a reality in Sweden since 1993. The diversification of regionally based new universities and university colleges with a broad spectra of education programmes at bachelor and master levels has been supported by a public policy of increased education level of the population. The Bologna process is also demanding an increased mobility at the university market.

The three main areas: three cycle system, quality assurance and recognition of studies are

general areas, but worked through in specific areas as indicators. The analysis of the six indicators mentioned above illustrate the spectrum of perspectives that we are working through, in order to comply better with the main areas. The Swedish system of higher education is changing, and we are actively participating within our specific area of land surveying. We are proudly offering our education system to European students, in international master programmes. We also encourage lecturers to participate in international exchange, in other countries. We endeavour to be an attractive partner at the European market in land surveying.

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